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Utility Program to Gridprint NMC Data Fields

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NWPK04A

Utility Program to Gridprint NMC Data Fields

A program (NWPK04A) is available for gridprinting NMC data fields, as identified and described in NMC Office Note 28, on the CDC 6600. The program allows the user to search magnetic tapes (eg., FMARKIV or PEPMERG) or disk files for up to 100 desired data fields to be processed for gridprinting at 8 lines per inch. All print constants are pre-programmed, and except for option "c" below, the full data field, as indicated by grid type marker, Table 5, NMC O. N. 28, will be gridprinted.

User options include:

(a) Initially skipping a certain number, LL, of files before beginning search for desired data fields (see CARD1 format);

(b) Specifying the maximum number, MM, of files to be searched for the desired data fields, up to a maximum of 30 files (see CARD1);

(c) Signifying that a 47 x 51 subset of a 53 x 57 gridded data field is to be printed (the three outer rows and columns of the 53 x 57 field are not printed). This option is controlled by NN on CARD1;

(d) Modifying the programmed print constants as outlined below. Use of this option requires that the user provide desired print constants (see PCON format) on a data card immediately following the IDCARD for the desired data field. This option is activated by setting K = 1 on IDCARD (see IDCARD format).

All data cards are read by NWPK04A via the INPUT file. Options (a), (b), and (c) must be specified by the user on the first data card, CARD1. Each desired data field to be gridprinted must be specified by IDCARD(s) which must contain the first three unique identification words (octal) as described in NMC O. N. 28. These IDCARD cards do not have to be in the same order as the data fields on tape or disk. An inventory program is available through the Librarian, Automation Division, which will supply the first three octal identification words of each NMC data field along with a brief interpretation of the identification words.

Option (d) above allows the user to modify the programmed print constants for a given data field. If K = 1 on an IDCARD, the user must provide the desired print constants, PCON, immediately following that IDCARD. The normal setting for K is 0 or blank. The indicated print constant changes will apply to the IDCARD immediately preceding the PCON card. If the user wishes to modify the print constants of similar data fields, each IDCARD must be followed by a PCON card and, of course, K must be set to 1 on the IDCARD. If IDCARD has K = 1 and is not followed by a PCON card results are unpredictable.

NWPK04A expects to read the data fields from logical file TAPE3. The program needs 40000 octal locations for execution. See example below.

CARD1 format

Element	Card Columns	Description
LL	1-2	Number of logical files to skip (forward) initially before beginning search for desired data fields (0-99).
MM	3-4	Number of files to search (forward) to find the desired data fields for gripdrinting. MM must be at least 1, but a maximum of 30 is allowed. If MM is set outside these limits, an error message will be issued and the job will terminate.
NN	5-6	(Optional) Normal setting is 0 or blanks. If the user wishes to gridprint the 47 x 51 subset of a 53 x 57 grid array (three outer rows and columns not printed), NN must be set to 01.
RES	7-30	Reserved.
MISC	31-80	User comments, if desired.

IDCARD format

Element	Card Columns	Description
ID1	1-20	1st unique identification word (octal) of desired data field, per NMC Office Note 28.
ID2	21-40	2nd " " " " " "
ID3	41-60	3rd " " " " " "
K	61	(Optional) Normal setting is 0 or blank. If the user desires to provide his own print constants for this data field, K must be set to 1, and an appropriate PCON card must follow this IDCARD via INPUT. ("See pgs. 4 and 5 for listing of programmed print constants.")
RES	62	Reserved.
MISC	63-80	User comments, if desired.

Note: If more than 100 IDCARD's are encountered, the excess will not be processed.

PCON format

Element	Card Columns	Description	Format
ADD	1-20	Additive constant for gridprint	F20.10 or E20.10
MULT	21-40	Multiplicative " " "	" "
CONT	41-60	Contour interval " "	" "
BASE	61-80	Base contour " "	" "

Note: The value printed will be equal to the value of the data to be gridprinted times MULT plus ADD. For additional information concerning these constants, see NMC write-up for GRDPRT.

LAST Card A blank card, an EOR (multiple punches 7,8,9 in column 1), or an EOF (multiple punches 6,7,8,9 in column 1) card will terminate the data cards to be read via INPUT for NWPK04A.

Approximate CPU Timings

Grid size	CPU time, in seconds, per gridprint process
47 x 51	5.1
53 x 57	6.7
24 x 73	2.9
1977-octagon	4.0

Note: Time will vary depending on which machine is used. "A is faster than "B" or "C" as of this date.

Programmed Print Constants in NWPKC4A

Data Type Code (Q, Table 1) (O.N. 28)	Description / units	Print Constants Add.	Mult.	Cont.	Base	Units Printed	Remarks
1 or 2	Heights, meters	0.	1.	60.	0.	meters	pressure greater than 500 mb
	" "	0.	1.	120.	0.	meters	pressure less than or equal to 500 mb
	" "	0.	1.	500.	2.	"	S-code 129 or 130 (ON28)
8	Pressure, mb	0.	1.	4.	0.	mb	
	" "	0.	1.	25.	0.	"	S-code 129 or 130 (ON28)
16,17,18	Temperature, deg K	-273.15	1.	5.	0.	deg C	
19	" "	0.	1.	5.	0.	deg K	
20,21	" "	-273.15	1.	5.	0.	deg C	
40,41	Vert. Velocity, mb/sec	0.	-1.E3	2.	0.	microbars / sec	positive upwards
48,49,50,51	Wind Speed, meters/sec	0.	1.	10.	0.	meters/sec	
52	Vert. Speed Shear, /sec	0.	592.086	2.	0.	knots/ 1000 ft	
53	Divergent u-comp, m/sec	0.	1.	2.	0.	m/sec	
54	" v " "	0.	1.	2.	0.	"	
72,73	Vorticity, /sec	0.	1.E6	40.	0.	10^6/sec	
74	Divergence, /sec	0.	1.E6	20	0.	10^6/sec	

80	Stream function, m^2/sec	0.	1.0523E-5	60.	0.	meters	1.03125E-4/9.8
81	Velocity potential, m^2/sec	0.	1.0523E-5	60.	0.	meters	"
88	Relative humidity, %	0.	1.	10.	0.	%	
89	Precipitable water, Kg m^{-2}	0.	3.937	50.	0.	hundredths inches per cm^2	
90	Accumulated precipitation, m	0.	3937.	50.	0.	Hundredths inches	
91,92	Probability of precipitation, %	0.	1.	10.	0.	%	
93	Snow depth, m	0.	39.37	6.	0.	inches	
112	Lifted index, deg K	-273.15	1.	2.	0.	deg C	
120,121	Wave components, m	0.	1.	10.	0.	m	
160	Drag Coef., dimensionless	0.	1.E5	100.	0.	10^5	
161	Land/sea, dimensionless	0.	1.	1.	0.		
384	Water temperature, deg K	0.	1.	5.	0.	deg K	
385	Hgt of wind driven waves, m	0.	1.	2.	0.	m	
386	Hgt of sea swells, m	0.	1.	2.	0.	m	
387	Combined hgt of waves and swells, m	0.	1.	2.	0.	m	

Example: A user wishes to locate and gridprint analyzed 500 mb fine-mesh height field for the 47x51 subset of the 53x57 gridded data field located in NMC logical file FMANL; the 24-hour 500 mb fine-mesh height forecast (1977-point octagon), and 24-hour forecast u- and v-wind components at 500 mb. However, the user would like to display the u- and v-components in knots instead of meters/sec as programmed. All desired data fields should be on magnetic tape E04572 which is multi-filed. Desired data fields should not be found in the first five files on E04572, so they will be initially skipped.

CDC 6600 Deck setup.

```
JXXXX,T100,CM40000,TP1.   USER NAME, BIN NO.
ATTACH(NWPK04A,W3LBRDK,CY=55,PW=READ)
JUMP(GO)
EXIT.
RETURN(NWPK04A)
REQUEST,CODE,HI. E08042 (P)     TAPE BACKUP
REWIND(CODE)
RFL,10000.
COPYBF(CODE,NWPK04A)
RETURN(CODE)
PASS(GO)
RFL,1000.
REQUEST,TAPE3,HI,E.  E04572 (P)    12Z THURS FMARKIV
REWIND(TAPE3)
RFL,40000.
SETCORE(INDEF,ADDR)
NWPK04A.
RETURN(TAPE3)
EXIT.
COMMENT.   JOB FAILED .....
RETURN(TAPE3)
7-8-9*   END OF RECORD

050401
0001001014152042000000000000000000000000000000000000000000005    500Z,T=0
0001001014152042003000000000000000000000000000000000000000006    500Z,T=24
0060001014152042003000000000000000000000000000000000000000061   500U,T=24
             0.       1.94254                    10.               0.
0061001014152042003000000000000000000000000000000000000000061   500V,T=24
          0.              1.94254                      10.          0.
       ( b l a n k )                                               LAST CARD

6-7-8-9*  END OF FILE
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*Multiple punch in column 1 of card.